

State of Colorado  
**Oil and Gas Conservation Commission**



#8208

FOR OGCC USE ONLY

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

**SITE INVESTIGATION AND REMEDIATION WORKPLAN**

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:  
Spill                      Complaint  
Inspection              NOAV  
Tracking No: 2146796

**CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED**

Spill or Release    Plug & Abandon    Central Facility Closure    Site/Facility Closure    Other (describe): \_\_\_\_\_

OGCC Operator Number: _____	Contact Name and Telephone: _____
Name of Operator: _____	_____
Address: _____	No: _____
City: _____ State: _____ Zip: _____	Fax: _____

API Number: _____	County: _____
Facility Name: _____	Facility Number: _____
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____	Latitude: _____ Longitude: _____

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): \_\_\_\_\_

**Site Conditions:** Is location within a sensitive area (according to Rule 901e)?              Y              N              If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): \_\_\_\_\_

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: \_\_\_\_\_

Potential receptors (water wells within 1/4 mi, surface waters, etc.): \_\_\_\_\_

\_\_\_\_\_

**Description of Impact** (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
Soils	_____	_____
Vegetation	_____	_____
Groundwater	_____	_____
Surface Water	_____	_____

**REMEDIALTION WORKPLAN**

**Describe initial action taken** (if previously provided, refer to that form or document):

\_\_\_\_\_

**Describe how source is to be removed:**

\_\_\_\_\_

**Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:**

\_\_\_\_\_



# **FREMONT ENVIRONMENTAL INC.**

December 7, 2013

Mr. Jacob Evans  
Noble Energy  
1625 Broadway, Suite 2000  
Denver, CO 80202

Subject:     **Excavation Report**  
          Bohlender D20-4  
          API # 05-123-16669  
          Weld County, Colorado  
          Fremont Project No. C013-062  
          Facility #248867

Dear Mr. Evans:

Enclosed please find a copy of the above referenced Excavation Report for the Bohlender D20-4 flow line release in Weld County, Colorado. The enclosed report describes excavation actions to remove impacted soil from the site. Please contact me at (303) 956-8714 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

Sincerely,  
**FREMONT ENVIRONMENTAL INC.**



Paul V. Henehan, P.E.  
Senior Consultant

Enclosure

**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**BOHLENDER D20-4**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C013-062**  
**FACILITY #248867**

**Prepared by:**

**Fremont Environmental Inc.**  
**12061 Pennsylvania Street, Suite B-101**  
**Thornton, CO 80241**  
**(303) 956-8714**

**December 7, 2013**

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**EXCAVATION REPORT**  
**NOBLE ENERGY INC.**  
**BOHLENDER D20-4**  
**WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C013-062**

**1.0 INTRODUCTION**

The purpose of this document is to present information collected during the excavation of petroleum-impacted soil at the Bohlender D20-4 flow line release location in Weld County, Colorado. This three day excavation project was completed between November 14 and November 18, 2013.

**2.0 BACKGROUND INFORMATION**

**2.1 Site Location**

The Bohlender D20-4 site is located approximately 14 miles east of Platteville, Colorado in Weld County as shown on Figure 1. The site is located in a rural and agricultural area approximately ½ mile southeast of the intersection of County Road 51 and County Road 32. The location is further described as the NE ¼ of the NW ¼ of Section 20, Township 3N, Range 64W.

**2.2 Site History**

The site consists only of the flow line from the Bohlender D20-4 natural gas well; the tank battery and separation equipment were not impacted. This well was drilled in 1993 to a depth of approximately 7,174 feet. Surface impacts were recently identified at the facility during routine operations when stained soil was observed above the buried flow line.

### **3.0 FIELD ACTIVITIES**

Remediation efforts consisted of removal of a section of the flow line as well as excavation of this petroleum-impacted site. Ground water was not encountered in this excavation which had a maximum depth of 20 feet. The soil consisted of topsoil which was underlain by sand to a depth of approximately 20 feet. The excavated area is shown on Figure 2.

Excavation was initiated near the eastern end of the overall dig on November 14, 2013 and continued west adjacent to the buried flow line. As the flow line was uncovered, sections of this pipe were removed to allow continued excavation. After clean soil was observed to the east, soil removal continued to west until all impacted soil was excavated on November 18, 2013.

A total of 810 cubic yards of petroleum impacted soil were removed by BG Oilfield Services Inc. from the location over a three day period. The impacted soil was disposed of at the Waste Management Inc. Buffalo Ridge landfill in Keenesburg, Colorado as non-hazardous waste.

A photoionization detector (PID) was used to field screen soil samples during the excavation. The instrument was calibrated with a 100 ppm isobutylene standard. Based on the field screening results, eight soil samples were collected from the floor and side walls of the excavation to confirm that impacted soil had been removed. The laboratory analyses indicated that all of these samples had concentrations that were less than the Colorado Oil and Gas Conservation Commission (COGCC) limits.

The soil samples had a one day turnaround time from the laboratory. Therefore, if the analysis from a sample indicated that it did not pass the COGCC criteria, additional

excavation could be undertaken the following day (or days) prior to the backfilling of an area. The locations of the soil samples are shown on Figure 2.

The side wall samples were collected as grab samples near the lower/middle portion of the excavation wall at depths ranging from six to 18 feet depending on the floor depths. The depth of the floor was approximately 20 feet directly below the flow line release location but the depth became increasingly shallow with distance from the release location. At the eastern and western extent of the excavation, the depth was approximately six to eight feet. The floor samples were also collected as grab samples from the bottom of the excavation.

The soil samples were analyzed by eAnalytics Laboratory, Inc. of Loveland, Colorado for benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO) by EPA method 8260C, and TPH - Diesel Range Organics (TPH-DRO) by EPA method 8015. The laboratory reports and chain-of-custody documentation are included in Appendix A.

A summary of the laboratory data is included in Table 1. This table shows the PID value and laboratory analyses for each soil sample. In addition, a column stating whether the laboratory analyses passed or failed the COGCC limits is provided. The laboratory analyses indicated that all of the eight soil samples collected achieved the COGCC Table 910-1 limits.

A daily summary of the excavation work is provided below:

**November 14, 2013 (Day 1)** -Excavation of the flow line was initiated near the eastern limit of impact. Excavation continued to the west as clean sidewalls were encountered. Petroleum impacted soil was present to a depth of approximately 18 feet in the

northeastern corner of the overall excavation. The soil consisted of sand throughout the excavation. Ground water was not encountered during the entire project.

One wall samples (1-5') was collected and submitted to the laboratory for analyses. The location of the soil sample is illustrated on Figure 2. The PID values and laboratory analyses are provided on Table 1. Approximately 80 cubic yards of impacted soil were removed using a backhoe and transported to the landfill. The depth of the excavation appeared to be close to the maximum reach of the backhoe; therefore, a track excavator was scheduled to mobilize to the site for completion of the project.

**November 15, 2013 (Day 2)** - The excavation proceeded north along the flow line and approximately 15 to 20 feet north from the pipeline. Three wall samples (3-15', 5-18', and 6-6') and two floor samples (2-20' and 4-12') were collected and submitted to the laboratory. Approximately 580 cubic yards of impacted soil were removed and transported to the landfill. The location of the soil sample is illustrated on Figure 2. The PID values and laboratory analyses are provided on Table 1.

**November 18, 2013 (Day 3, Final Day)** - Excavation continued along the south side of the flow line. The depth of the excavation varied from approximately 15 feet at the center of the excavation but became increasingly shallow as the excavation proceeded to the east and west. The depth of the impacted soil on the eastern edge of the overall excavation was approximately six feet whereas the depth was approximately eight feet in the southwestern corner.

Two side wall samples (7-8' and 8-16') were collected and submitted to the laboratory. Approximately 150 cubic yards of impacted soil were removed and transported to the landfill. The locations of the soil samples are illustrated on Figure 2. The PID values and laboratory analyses are provided on Table 1.

#### **4.0 DISCUSSION**

As demonstrated by the soil sampling, the petroleum impacted soil was removed from the site by excavation. This was confirmed by the analyses of the soil samples collected from the excavation floor and sidewalls which were below the COGCC Table 910-1 concentrations. Approximately 810 cubic yards of impacted soil were removed and transported to the landfill. Ground water was not encountered in this excavation which had a maximum depth of approximately 20 feet. Therefore, Noble should request a no further action (NFA) determination from the COGCC.

#### **5.0 REMARKS**

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**

 For MVA

12/7/13

Date \_\_\_\_\_

\_\_\_\_\_  
Wayne Austin

Construction Consultant

Reviewed by:



12/7/13

Date \_\_\_\_\_

\_\_\_\_\_  
Paul V. Henehan, P.E.

Senior Consultant

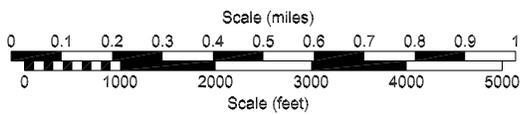
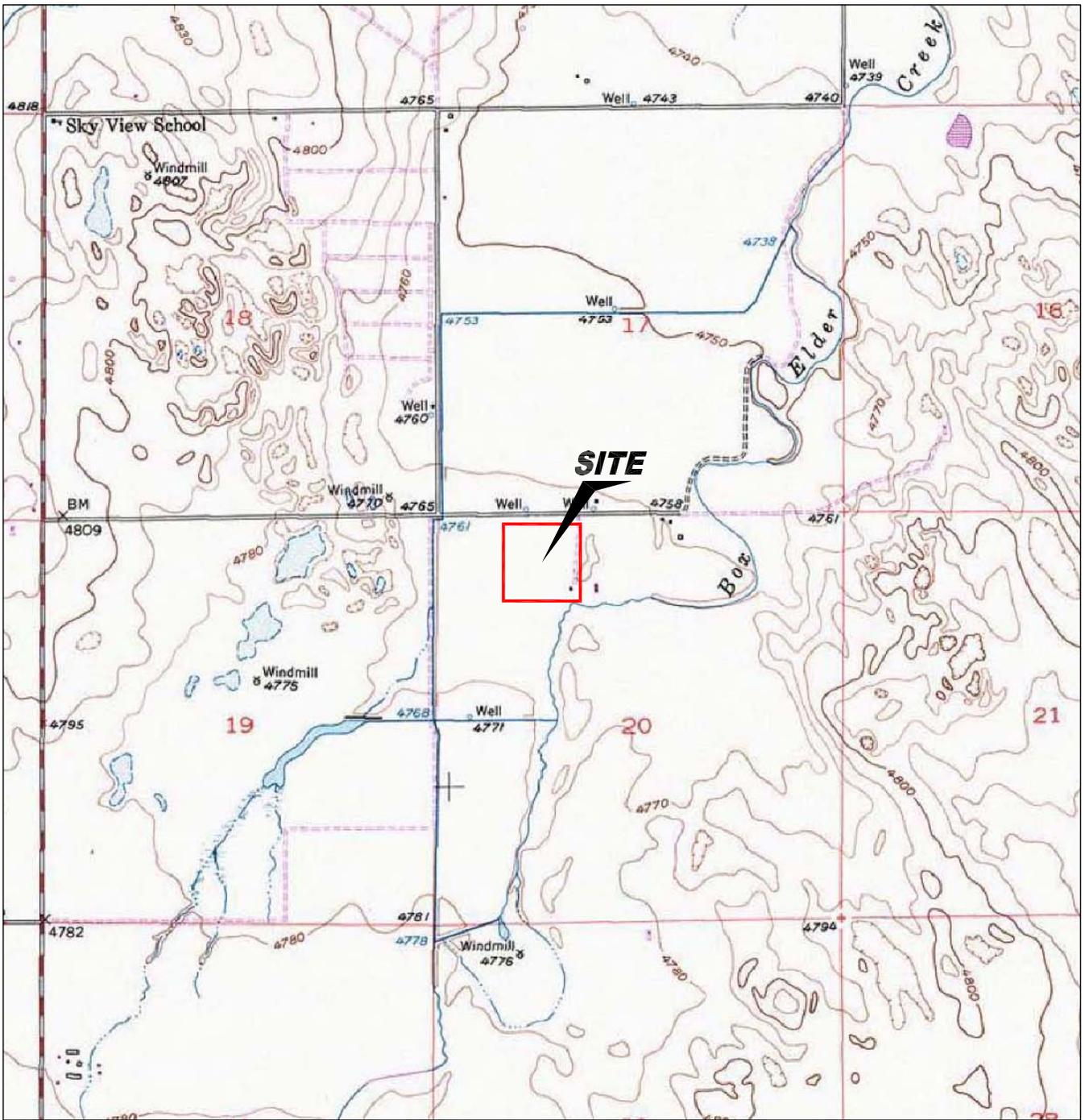
**TABLE**

**TABLE 1**  
**SUMMARY OF SOIL CHEMISTRY DATA**  
**NOBLE ENERGY INC.**  
**BOHLENDER D20-4, WELD COUNTY, COLORADO**  
**FREMONT PROJECT NO. C013-062**

Sample	Depth (ft)	Date Sampled	Location	Pass or Fail	PID (ppm)	Benzene mg/kg	Toluene mg/kg	Ethyl-Benzene mg/kg	Xylenes mg/kg	Naphthalene mg/kg	TPH GRO mg/kg	TPH DRO mg/kg
1-5'	5	11/14/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
2-20'	20	11/15/2013	Floor	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
3-15'	15	11/15/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
4-12'	12	11/15/2013	Floor	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
5-18'	18	11/15/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
6-6'	6	11/15/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
7-8'	8	11/16/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
8-16'	16	11/16/2013	Sidewall	Pass	0	<0.01	<0.01	<0.01	<0.01	<0.01	<50	<50
COGCC Table 910 Limits						0.17	85	100	175	23	500	500

Bold faced values exceed the COGCC Table 910-1 concentrations

## FIGURES



USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
SITE LOCATION MAP

**Noble Bohlender D20-4**  
NE NW Section 20, T3N, R64W  
Weld County, Colorado

Project No. C013-062	Prepared by	Drawn by JMA
Date 10/25/13	Reviewed by	Filename 13062T





**LEGEND**

- - - - - PIPELINE
- X SOIL SAMPLE LOCATION

**Figure 2  
SITE MAP**

**Noble Bohlender D20-4**  
NE NW Section 20, T3N, R64W  
Weld County, Colorado

Project No. <b>C013-062</b>	Prepared by	Drawn by <b>JMA</b>
Date <b>1/13/14</b>	Reviewed by	Filename <b>13062Q</b>



APPENDIX A

LABORATORY DOCUMENTATION

# Certificate of Analysis

## eANALYTICS LABORATORY

November 21, 2013

Client: Fremont Environmental  
PO Box 1289  
Wellington CO 80549

Project: Bohlender 20-4

Lab ID: 301

Date Received: 11/18/13

Number of Samples Received: 8

Sample Condition: Samples arrived intact and in appropriate sample containers

Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

Analysis	EPA Method	Lab ID on COC
BTEX / Nap	8260C	1 - 8
TPH - GRO/DRO	8260C/8015C	1 - 8

All quality control analyses associated with the requested analyses were satisfactorily passed before the samples were run. If you have any questions please give us a call, we are happy to help.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you, we truly appreciate your business.

Sincerely,



Christopher Dieken  
Quality Assurance Manager



Todd Rhea  
Laboratory Manager

eAnalytics Laboratory  
(970) 667-6975  
info@eAnalyticsLab.com



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